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LISTS OF SPECIES

Checklist of the brachyuran crabs (Crustacea: Decapoda) in the rocky subtidal of Vitória Archipelago, southeast coast of Brazil

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ABSTRACT: Biodiversity can be useful as an ecosystem indicator for conservation and monitoring, through continuous assessment of its main properties including stability, primary productivity, exploitation tolerance and even global environmental changes. The main purpose of this study was to provide a checklist of the crabs associated with subtidal rocky bottoms at the Vitoria Archipelago, southeastern Brazilian coast. Monthly collections were carried out from February 2004 through January 2006 on three islands at the Vitória Archipelago (23°44'S-45°01'W). The crabs were hand-caught by SCUBA divers during the daytime, in rock subtidal. A total of 3084 individuals were caught, belonging to 42 species, 28 genera, and 12 families, highlighting *Mithraculus forceps* (1528) and *Stenorhynchus seticornis* (407) representing more than 60% of the sample. On the other hand, *Dromia erythropus*, *Moreiradromia antilensis*, *Ebalia stimpsoni*, *Garthiope spinipes* and *Tumidotheres maculatus* had only one individual sampled.

INTRODUCTION

The Brazilian southeastern coast has two principal characteristics that make it an interesting area for studying marine biodiversity, 1) the interaction of two main water currents of the western Atlantic, the Brazil Current and the Malvinas (Falkland) Current, which in this region produce a hydrological and faunistic transition area (Coelho and Ramos 1972; Palacio 1982; Boltovskoy 1999; Boschi 2000a, b); and 2) a wide diversity of protected environments along the highly indented coastline of the states of Rio de Janeiro and São Paulo, which provide shelter for many marine species (Mahiques 1995).

However, despite the present perception of the necessity to conserve and preserve biodiversity, little has been done concerning the marine rocky-bottom (Witman and Dayton 2000). In addition, these authors also pointed to the urgency in increasing human understanding about subtidal environments, in both theory and practice, because most threats and impacts to marine biodiversity caused by fisheries, pollution, etc., will occur in regions along the tide line.

In marine environments, decapod crustaceans are among the most diverse and abundant animal groups. Human exploitation may disastrously impact this fauna, both through fisheries and through the aquarium trade (Calado *et al*. 2003; Costa *et al*. 2007; Balaji *et al.* 2009; Gregati *et al.* 2010). Often, laws regulating these activities are ignored, increasing the threat to this group. Continuous monitoring programs are required in order to evaluate the degree of conservation of these animals. Despite this, data concerning the crab biodiversity on rocky bottoms of the Brazilian southeastern coast remain sparse (Mantelatto *et al*. 2004a, b).

The present study aims to contribute to the knowledge of the richness of the brachyuran crabs on subtidal rocky bottoms in the Vitória Archipelago and enable to mapping the biodiversity of crabs in the Brazilian coast.

MATERIALS AND METHODS

Crabs were obtained during a sampling program carried out on rocky subtidal bottoms at the Vitória Archipelago (Vitória Island 23°44'57"S, 45°01'02" W; Pescadores Island 23°44'13"S, 45°01'21"W; Cabras Island 23°44'17"S, 45°01'54" W) on the northeastern coast of São Paulo State in southeastern Brazil (Figure 1). Monthly manual samplings were carried out for two years, from February 2004 through January 2006 by SCUBA divers during the daytime for two collectors at a depth from 5 to 15 m. Rocky subtidal of these islands is composed of boulders of different sizes, with a low slope and a great variety of macroalgae and sessile invertebrates (*e.g*., sponges, coral heads, mussels, ascidians) covering this area. The crabs were caught manually in rock openings, between rocks and between sessile organisms, and also along the sand bottom border.

Sampled individuals were stored in plastic bags and frozen, and posteriorly transferred to the laboratory of zoology of the University of Taubaté - UNITAU, where they were preserved in 70% ethanol and placed in labeled jars. The individuals were measured at their largest carapace width with vernier calipers (0.1 mm). In the laboratory, the sex and developmental stage of the animals were identified, based on the external morphology of the abdomen and its appendages (see Haefner 1990). The crabs were grouped according to sex and developmental stage as follows: adult male (M), adult female (F), ovigerous

female (OF) and juvenile (J). The brachyuran crabs were identified according to Melo (1996), and their taxonomic status was determined following Ng *et al.* (2008). All the crabs collected are deposited in the scientific collection of carcinology, Zoology Laboratory, University of Taubaté (UNITAU) and the carcinological collection of the Zoology Museum of the University of São Paulo (MZUSP).

Results and Discussion

A total of 3084 crabs were recorded, representing 12 families, 28 genera and 42 species. Families with the highest number of species were Majidae (10) and Xanthidae (10), followed by Panopeidae (8), Dromiidae (2), Epialtidae (2), Pilumnidae (2), Portunidae (2), Pinotheridae (2), Menippidae (1), Leucosidae (1), Inachidae (1) and Domeciidae (1) (Table 1).

Order Decapoda Latreille, 1802

Suborder Pleocyemata Burkenroad, 1963

Superfamily Dromioidea De Haan, 1833

Family Dromiidae De Haan, 1833

Subfamily Dromiinae De Han, 1833

***Dromia erythropus* (George Edwards, 1771) (Figure 2A)**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Bermuda, Antilles, north of South America and Brazil (Fernando de Noronha and from Amapá to Santa Catarina) (Melo and Campos Jr. 1999; Viana *et al.* 2003a, b).

Figure 1. Map of South America, indicating the Vitória Archipelago. 1 – Vitória Island; 2 Pescadores Island; 3 – Cabras Island.

Material examined: 1 F, size 19.8 mm CW. Sponge fragments carried on the dorsal surface of the carapace. UNITAU 201201.

***Moreiradromia antillensis* (Stimpson, 1858)**
Geographic distribution: Western Atlantic – North Carolina, Bermuda, Florida, Gulf of Mexico, Antilles, Venezuela, Guyana, Suriname, French Guyana and Brazil (from Amapá to Rio Grande do Sul) (Melo 2010). Central Atlantic – Ascencion I. (Manning and Chace, 1990, as *Dromidia antillensis*; Melo 1996, as *Cryptodromiopsis antillensis* (Coelho et al. 2008).
Material examined: 1 F, size 14.5 mm CW. Sponge fragments carried on the dorsal surface of the carapace. UNITAU 201202.

Superfamily Eriphioidea MacLeay, 1838

Family Menippidae Ortmann, 1893

***Menippe nodifrons* Stimpson, 1859**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Central America, West Indies, north of South America and Brazil (from Pará to Santa Catarina). Eastern Atlantic – Cape Verde to Angola (Melo 1998; Coelho *et al.* 2008).
Material examined: 12 M, 4 F, 1 OF and 18 juveniles, size range: 4.3 ≤ CW ≤ 73.5 mm. Average: CW = 24.8 ± 18.4 mm. UNITAU 201203.

Superfamily Leucosioidea Samouelle, 1819

Family Leucosiidae Samouelle, 1819

Subfamily Ebaliinae Stimpson, 1871

***Ebalia stimpsoni* A. Milne Edwards, 1880**
Geographic distribution: Western Atlantic – North Carolina, Florida, Gulf of Mexico, Antilles, Colombia and Brazil (from Amapá to São Paulo) (Melo 1998).
Material examined: 1 F, size 4.1 mm CW. A single individual was captured on the border between rocks and sand, found on shell fragments. UNITAU 201204.

Superfamily Majoidea Samouelle, 1819

Family Epialtidae MacLeay, 1838

Subfamily Pisinae Dana, 1851

***Apiomithrax violaceus* (A. Milne Edwards, 1868)**
Geographic distribution: Western Atlantic – Venezuela and Brazil (from Ceará to Rio Grande do Sul) (Coelho *et al.* 2008; Mora-Day *et al.* 2008; Lira *et al.* 2010; Melo 2010). Eastern Atlantic – Cape Verde and from Cabo Branco to Angola. Central Atlantic – Ascension Island (Melo 2010).
Material examined: 1 OF and 2 J, size range: 1.6 ≤ CW ≤ 25.9 mm. Average: CW = 10.9 ± 13.1 mm. The individuals had the carapace and pereopods decorated with filamentous algae, shell fragments and other ornaments. UNITAU 201205.

Subfamily Tychinae Dana, 1851

***Pitho lherminieri* (Desbonne, in Desbonne and Schramm, 1867) (Figure 2B)**
Geographic distribution: Western Atlantic – From North Carolina to Florida, Gulf of Mexico, Antilles and Brazil (from Pará to São Paulo, and Fernando de Noronha) (Melo 1998).
Material examined: 3 M, 1 F and 2 OF, size range: 5.8 ≤ CW ≤ 13.2 mm. Average: CW = 9.6 ± 3.0 mm. UNITAU 201206.

Family Inachidae MacLeay, 1838

***Stenorhynchus seticornis* (Herbst, 1788) (Figure 2C)**
Geographic distribution: Western Atlantic – Bermuda, North Carolina, Florida, Gulf of Mexico, Antilles, Colombia, Venezuela, Guyanas and Brazil (from Amapá to Rio Grande do Sul), Uruguay and Argentina (Melo 1998).
Material examined: 151 M, 37 F, 67 OF and 152 J, size range: 1.8 ≤ CW ≤ 15.0 mm. Average: CW = 7.2 ± 2.7 mm. UNITAU 201207.

Family Majidae Samouelle, 1819

Subfamily Mithracinae MacLeay, 1838

***Microphrys antillensis* Rathbun, 1901 (Figure 2D)**
Geographic distribution: Western Atlantic – North Carolina, Florida, Gulf of Mexico, Antilles and Brazil (from Paraíba to São Paulo) (Melo 1998; Alves *et al.* 2006).
Material examined: 2 M, 2 F, 10 OF and 2 J, size range: 3.4 ≤ CW ≤ 9.0 mm. Average: CW= 5.8 ± 1.2 mm. MZUSP 18035 (2), 18036 (2), 18037 (10) and 18038 (2).

***Mithraculus coryphe* (Herbst, 1801) (Figure 3A)**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Antilles, north of South America and Brazil (Fernando de Noronha and from Ceará to São Paulo) (Melo 1998).
Material examined: 2 M, 1 OF and 4 J, size range: 4.6 ≤ CW ≤ 11.2 mm. Average: CW = 8.5 ± 2.5 mm. UNITAU 201208.

***Mithraculus forceps* A. Milne-Edwards, 1875 (Figure 3B)**
Geographic distribution: Western Atlantic – From North Carolina to south of Florida, Gulf of Mexico, Antilles, Venezuela and Brazil (Fernando de Noronha and Rocas, and from Maranhão to Santa Catarina) (Rieger and Giraldi 1996; Melo 1998).
Material examined: 553 M, 105 F, 379 OF and 491 J, size range: 2.6 ≤ CW ≤ 21.8 mm. Average: CW = 9.5 ± 3.3 mm. UNITAU 201209.

***Mithraculus sculptus* (Lamarck, 1818)**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Antilles and Brazil (from Fernando de Noronha, and from Bahia to São Paulo) (Melo 1998; Coelho *et al.* 2008; Camargo *et al.* 2010).

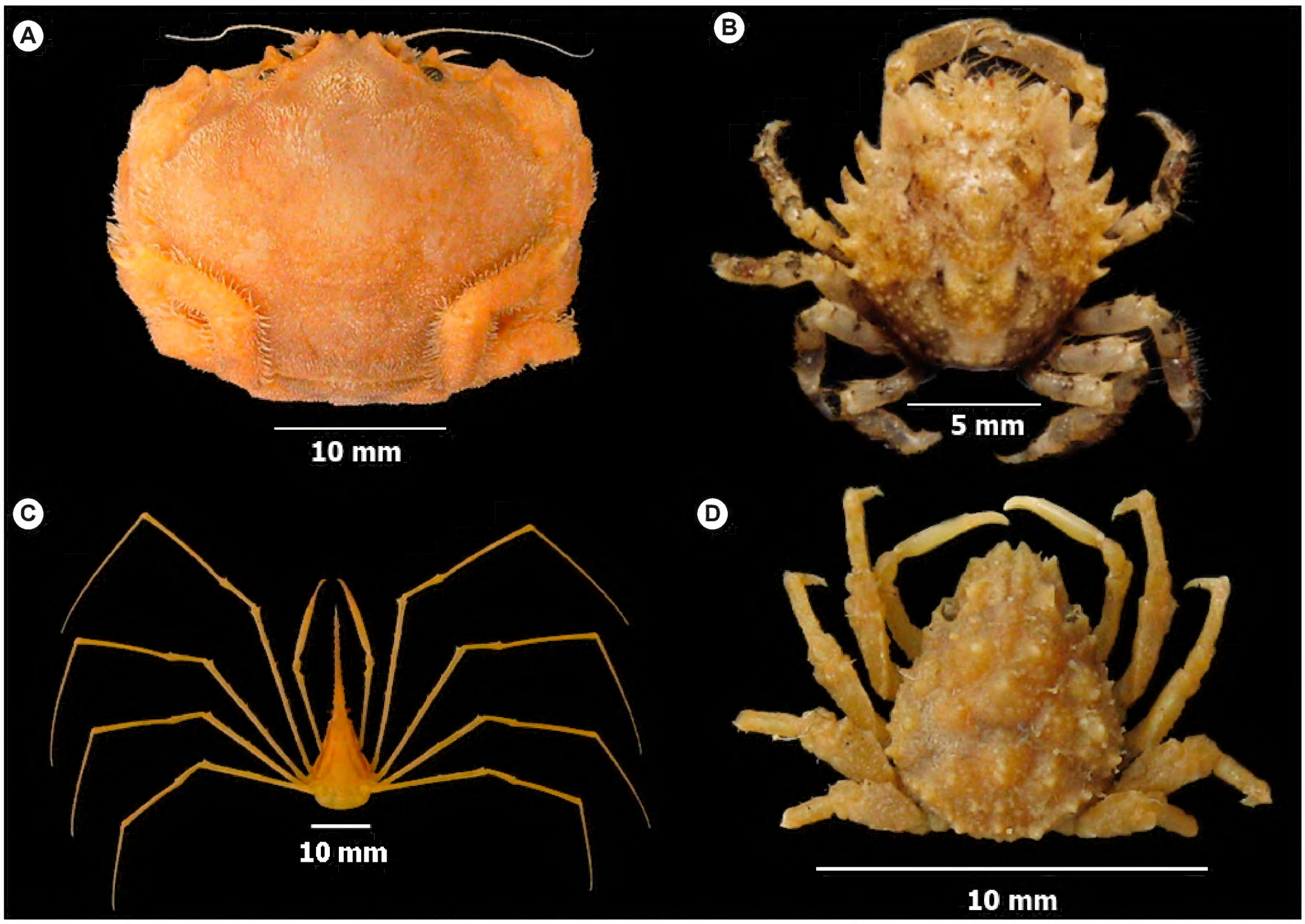

Figure 2. Brachyuran crabs from Vitória Archipelago, Brazil: A) *Dromia erythropus* (George Edwards, 1771); B) *Pitho lherminieri* (Desbonne, in Desbonne and Schramm, 1867); C) *Stenorhynchus seticornis* (Herbst, 1788); D) *Microphrys antillensis* Rathbun, 1901 (Photos: D.F.R. Alves).

Material examined: 1 M, 2 OF and 1 J, size range: 5.6≤ CW ≤12.6 mm. Average: CW = 10.0±3.1 mm. MZUSP 18039 (1); UNITAU 201210 (3).

***Mithrax braziliensis* Rathbun, 1892**
Geographic distribution: Western Atlantic – Brazil (from Paraiba to São Paulo) (Melo 1998; Mantelatto *et al*. 2004a; Coelho *et al*. 2008).
Material examined: 1 M, 3 F and 7 J, size range: 7.9 ≤ CW ≤ 21.7 mm. Average: CW = 15.3 ± 5.2 mm. UNITAU 201211.

***Mithrax hispidus* (Herbst, 1790)**
Geographic distribution: Western Atlantic – From Delaware to south of Florida, Gulf of Mexico, Antilles and Brazil (from Pará to Santa Catarina) (Melo 1998, Rieger and Giraldi, 2001).
Material examined: 4 J, size range: 4.8 ≤ CW ≤ 40.9 mm. Average: CW = 17.7 ± 16.5 mm. Four of those crabs were collected. Two of them were initially identified as *Mithrax caribbaeus* Rathbun, 1920, according to Melo (1996). However, Windsor and Felder (2009) reported that this species is a junior synonym of *M. hispidus*, based on analysis of three mitochondrial genes (12s, 16s and COI). MZUSP 16709 (2); UNITAU 201234 (2).

***Mithrax tortugae* Rathbun, 1920**
Geographic distribution: Western Atlantic – Florida, Antilles, Colombia, Venezuela and Brazil (Pará, Pernambuco, Alagoas, Bahia to São Paulo and Santa Catarina) (Coelho *et al.* 1990; Melo 1998; Rieger and Giraldi 2001; Coelho *et al.* 2002; Almeida *et al.* 2007).
Material examined: 22 M, 11 F, 29 OF and 55 J, size range: 2.8 ≤ CW ≤ 60.0 mm. Average: CW = 22.5 ± 11.9 mm. UNITAU 201212.

***Mithrax verrucosus* H. Milne Edwards, 1832 (Figure 3C)**
Geographic distribution: Western Atlantic – South Carolina, Florida, Gulf of Mexico, Antilles, Venezuela and Brazil (Fernando de Noronha, Rocas and São Paulo) (Melo 1998; Nizinski 2003; Alves *et al*. 2006).
Material examined: 2 M, 1 OF and 13 J, size range: 4.8 ≤ CW ≤ 14.7 mm. Average: CW = 8.6 ± 3.1 mm. MZUSP 16708 (1); UNITAU 201235(13).

***Nemausa acuticornis* (Stimpson, 1871)**
Geographic distribution: Western Atlantic – From North Carolina to Florida, Gulf of Mexico, Antilles and Brazil (Fernando de Noronha, Rocas and from Amapá to São

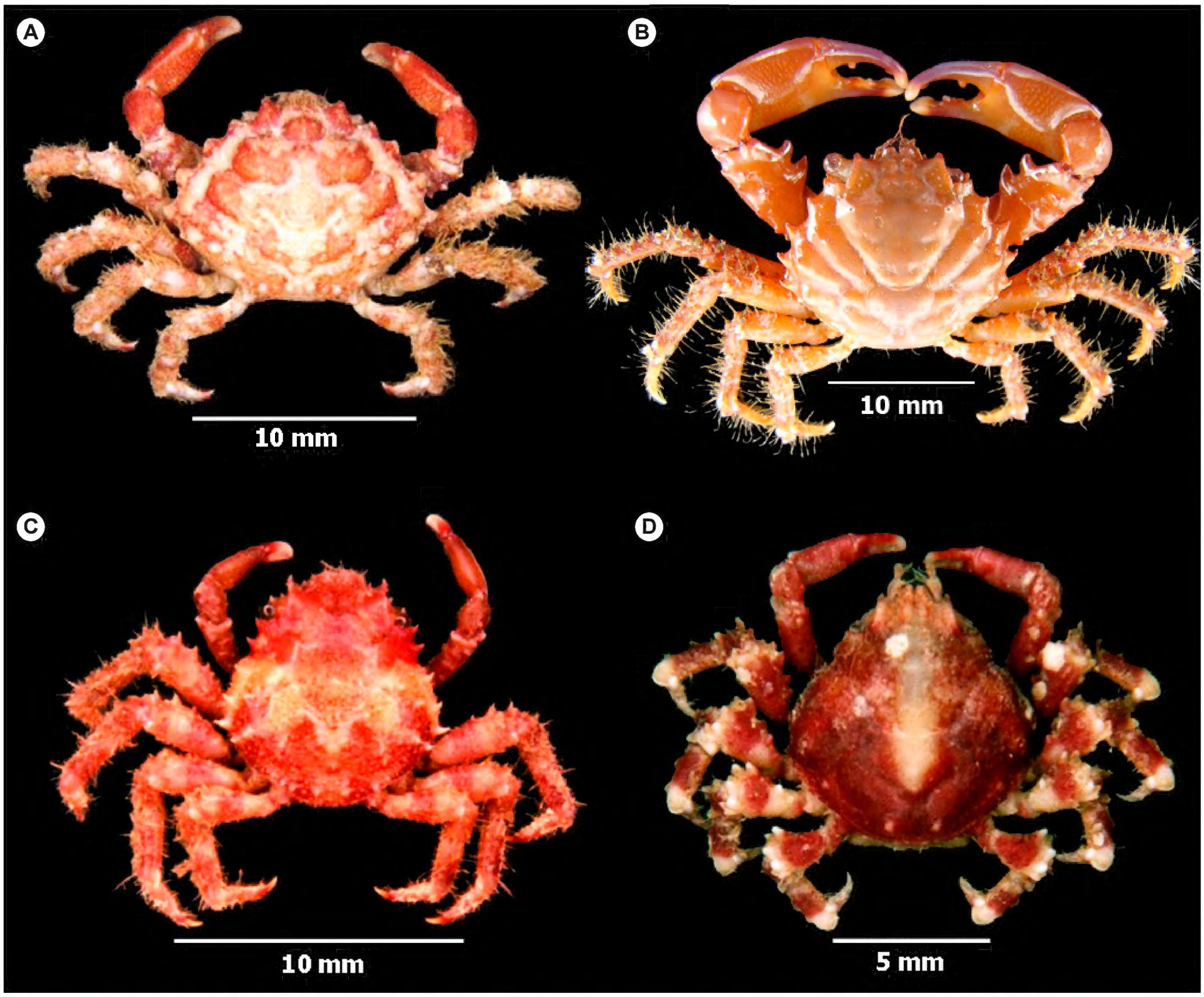

Figure 3. Brachyuran crabs from Vitória Archipelago, Brazil: A) *Mithraculus coryphe* (Herbst, 1801); B) *Mithraculus forceps* A. Milne-Edwards, 1875; C) *Mithrax verrucosus* H. Milne Edwards, 1832; D) *Teleophrys ornatus* Rathbun, 1901 (Photos: D.F.R. Alves).

Paulo) (Coelho 1971; Melo 1998; Alves *et al*. 2006; Coelho-Filho 2006).
Material examined: 4 J, size range: 4.5 ≤ CW ≤ 6.5 mm. Average: CW = 5.6 ± 1.0 mm. MZUSP 16704 (1); UNITAU 201240 (3).

***Teleophrys ornatus* Rathbun, 1901 (Figure 3D)**
Geographic distribution: Western Atlantic – Gulf of Mexico, Antilles and Brazil (Fernando de Noronha, Bahia and São Paulo) (Gouvêa 1986; Melo 1998; Alves *et al*. 2006).
Material examined: 2 OF, size range: 7.3 ≤ CW ≤ 7.5 mm. Average: CW = 7.4 ± 0.1 mm. MZUSP 16706 (1); UNITAU 201236 (1).

Superfamily Pilumnoidea Samouelle, 1819

Family Piluminidae Samouelle, 1819

Subfamily Pilumninae Samouelle, 1819

***Pilumnus reticulatus* Stimpson, 1860**
Geographic distribution: Western Atlantic – Antilles, Central America, north of South America, Brazil (from Amapá to Rio Grande do Sul), Uruguay and Argentina. Eastern Pacific – Gulf of California to Gulf of Panama (Barreto *et al.* 1993; Hendrickx 1995; Melo 1998; Coelho *et al.* 2008).
Material examined: 5 M, 5 F and 1 OF, size range: 5.8 ≤ CW ≤ 12.4 mm. Average: CW = 7.3 ±1.8 mm. UNITAU 201213.

***Pilumnus spinosissimus* Rathbun, 1898**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Antilles, Central America, north of South America, Brazil (Paraiba, and from Bahia to Rio Grande do Sul), Uruguay and Argentina (Melo 1998; Melo and Veloso 2005; Serejo *et al.* 2006; Coelho *et al.* 2008).
Material examined: 8 M, 6 F and 5 OF, size range: 5.5 ≤ CW ≤ 11.7 mm. Average: CW = 8.0 ± 1.5 mm. UNITAU 201214.

Superfamily Portunoidea Rafinesque, 1815

Family Portunidae Rafinesque, 1815

Subfamily Portuninae Rafinesque, 1815

***Achelous tumidulus* (Stimpson, 1871)**
Geographic distribution: Western Atlantic – Bermuda, Florida, Gulf of Mexico, Antilles, Guyanas and Brasil (from Amapá to São Paulo) (Coelho and Ramos-Porto 1992; Melo 1998).
Material examined: 2 J, size range: 13.9 ≤ CW ≤ 19.4 mm. Average: CW = 16.6 ± 3.9 mm. UNITAU 201216.

***Cronius ruber* (Lamarck, 1818)**
Geographic distribution: Western Atlantic – Virginia, North Carolina to southern of Florida, Gulf of Mexico, Central America, Antilles, north of South America, Guyanas and Brazil (from Amapá to Rio Grande do Sul). Eastern Atlantic – From Mauritania to Angola, Cape Verde, Principe, São Tomé and Annobon islands. Eastern Pacific – From Baja California to Peru and Galapagos Islands (Melo 2010).
Material examined: 2 M, 1 F, 1 OF and 11 J, size range: 6.6 ≤ CW ≤ 53.2 mm. Average: CW = 23.5 ± 14.3 mm. UNITAU 201215.

Superfamily Trapezioidea Miers, 1886

Family Domeciidae Ortmann, 1893

Subfamily Domoeciinae Ortmann, 1893

***Domecia acanthophora* (Desbonne, in Desbonne and Schramm, 1867) (Figure 4A)**
Geographic distribution: Western Atlantic – North Carolina, Bermuda, Florida, Gulf of Mexico, Antilles, northeastern of the South America and Brazil (Reefs of the São Pedro - São Paulo, Rocas, Fernando de Noronha, Ceará, Pernambuco and São Paulo) (Melo 1998; Alves *et al*. 2006; Coelho-Filho 2006).
Material examined: 2 M, 6 F and 4 OF, size range: 5.2 ≤ CW ≤ 10.8 mm. Average: CW = 8.3 ± 1.7 mm. MZUSP 16705 (1); UNITAU 201237 (11).

Superfamily Xanthoidea MacLeay, 1838

Family Panopeidae Ortmann, 1893

Subfamily Panopeinae Ortmann, 1893

***Acantholobulus schmitti* (Rathbun, 1930)**
Geographic distribution: Western Atlantic – Brazil (from Ceará to Santa Catarina) and Uruguay (Melo 1998).
Material examined: 17 M, 12 F, 2 OF and 2 J, size range: 5.3 ≤ CW ≤ 14.1 mm. Average: CW = 10.0 ± 2.5 mm. UNITAU 201217.

***Hexapanopeus angustifrons* (Benedict and Rathbun, 1891)**
Geographic distribution: Western Atlantic – From Massachusetts to South Carolina, Florida, Gulf of Mexico, Antilles and Brazil (from Pernambuco to Santa Catarina) (Melo 1998).
Material examined: 41 M, 20 F, 7 OF and 3 J, size range: 4.0 ≤ CW ≤ 17.6 mm. Average: CW = 11.6 ± 2.7 mm. UNITAU 201218.

***Hexapanopeus caribbaeus* (Stimpson, 1871)**
Geographic distribution: Western Atlantic – Antilles, northeastern of the South America, and Brazil (from Piauí to Rio Grande do Sul) (Rieger *et al*. 1996; Melo 1998; Coelho *et al.* 2008).
Material examined: 36 M, 62 F, 22 OF and 27 J, size range: 2.2 ≤ CW ≤ 14.6 mm. Average: CW = 8.1 ± 2.2 mm. UNITAU 201219.

***Hexapanopeus paulensis* Rathbun, 1930**
Geographic distribution: Western Atlantic – South Carolina, Florida, Gulf of Mexico and Brazil (from Pará to Santa Catarina) (Melo 1998).
Material examined: 4 M, 18 F, 7 OF and 9 J, size range: 2.6 ≤ CW ≤ 12.8 mm. Average: CW = 7.9 ± 2.6 mm. UNITAU 201220.

***Panopeus austrobesus* Williams, 1983**
Geographic distribution: Western Atlantic – Brazil (from Rio de Janeiro to Rio Grande do Sul) and Uruguay (Melo 1998).
Material examined: 2 M and 6 J, size range: 3.5 ≤ CW ≤ 7.8 mm. Average: CW = 5.4 ± 1.5 mm. UNITAU 201221.

***Panopeus harttii* Smith, 1869**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Antilles and Brazil (Fernando de Noronha and from Maranhão to São Paulo). Central Atlantic – Ascencion I. (Fausto-Filho 1974; Mannig and Chace 1990; Melo 1998).
Material examined: 47 M, 19 F, 7 OF and 35 J, size range: 3.0 ≤ CW ≤ 16.8 mm. Average: CW = 7.9 ± 3.1 mm. UNITAU 201222.

***Panopeus occidentalis* Saussure, 1857**
Geographic distribution: Western Atlantic – From North Carolina to Florida, Gulf of Mexico, Central America, Antilles, northeastern of the South America, Guyanas and Brazil (from Maranhão to Rio Grande do Sul) (Powers 1977; Ramos-Porto *et al.* 1978; Melo 1998).
Material examined: 11 M, 5 F, 1 OF and 2 J, size range: 3.3 ≤ CW ≤ 19.3 mm. Average: CW = 10.0 ± 4.0 mm. UNITAU 201223.

***Panopeus rugosus* A. Milne-Edwards, 1880**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Central America, Antilles, northeastern of the South America and Brazil (from Alagoas to Rio Grande do Sul) (Melo 1998).
Material examined: 16 M, 8 F, 4 OF and 2 J, size range: 5.8≤ CW ≤ 16.0 mm. Average: CW = 10.4 ± 3.0 mm. UNITAU 201224.

Family Xanthidae MacLeay, 1838

Subfamily Actaeinae Alcock, 1898

***Paractaea nodosa* (Stimpson, 1860) (Figure 4B)**
Geographic distribution: Western Atlantic – North Carolina, Florida, Gulf of Mexico, Antilles, northeastern of South America, Brazil (Fernando de Noronha and from Amapá to São Paulo) and Uruguay (Melo 1998; Cobo *et al.* 2002; Coelho-Filho 2006).
Material examined: 3 M, 8 F and 1 OF, size range: 6.9 ≤ CW ≤ 22.8 mm. Average: CW = 15.3 ± 5.1 mm. UNITAU 201225.

Subfamily Euxanthinae Alcock, 1898

***Glyptoxanthus vermiculatus* (Lamarck, 1818) (Figure 4C)**
Geographic distribution: Western Atlantic – Venezuela, Guyanas and Brazil (Bahia, Espírito Santo and São Paulo) (Melo 1998; Cobo *et al.* 2002; Serejo *et al.* 2006).
Material examined: 2 M, 3 F and 4 J, size range: 10.2 ≤ CW ≤ 28.7 mm. Average: CW = 17.4 ± 6.4 mm. UNITAU 201226.

Subfamily Xanthinae MacLeay, 1838

***Cataleptodius floridanus* (Gibbes, 1850)**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Bermuda, Antilles, Central America, northeastern of South America and Brazil (Rocas, Fernando de Noronha, and from Ceará to Rio Grande do Sul). Eastern Atlantic – Guinea to Gabon (Melo 1998).
Material examined: 5 F and 1 J, size range: 6.3 ≤ CW ≤ 13.5 mm. Average: CW = 9.5 ± 2.9 mm. UNITAU 201227.

***Cataleptodius parvulus* (Fabricius, 1793) (Figure 4D)**
Geographic distribution: Western Atlantic – Bermuda, Florida, Gulf of Mexico, Antilles, Venezuela and Brazil (Rocas Atol, Fernando de Noronha, Rio Grande do Norte and São Paulo) (Melo 1998; Ferreira and Sankarankutty 2002; Alves *et al.* 2006).
Material examined: 2 M, 2 F and 1 J, size range: 5.3 ≤ CW ≤ 11.4 mm. Average: CW = 8.7 ± 2.6 mm. Identified by Melo (1996) as *Xanthodius parvulus* (Fabricius, 1793); however, according to Ng *et al.* (2008), this species must be viewed of *C. parvulus*. MZUSP16707 (1); UNITAU 201238 (4).

***Garthiope spinipes* (A. Milne-Edwards, 1880)**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Antilles, Venezuela and Brazil (Maranhão, Rio Grande do Norte, Paraíba, Pernambuco, Espírito Santo and São Paulo) (Grajal and Laughlin 1984; Coelho and Ramos-Porto 1980; Coelho *et al.* 1986; Melo 1998; Coelho *et al.* 2002; Melo and Veloso 2005; Alves *et al.* 2006).
Material examined: 1 M, CW = 9.8 mm. MZUSP 16711.

***Melybia thalamita* Stimpson, 1871 (Figure 5A)**
Geographic distribution: Western Atlantic – Florida, Gulf of Mexico, Antilles, northeastern of South America and Brazil (from Pará to São Paulo) (Melo 1998).
Material examined: 5 J, size range: 2.5 ≤ CW ≤ 4.3 mm. Average: CW = 3.0 ± 0.7 mm. UNITAU 201227.

***Micropanope nuttingi* (Rathbun, 1898)**
Geographic distribution: Western Atlantic – North Carolina, Florida, Gulf of Mexico, Antilles and Brazil (from Amapá to São Paulo) (Melo 1998).
Material examined: 114 M, 24 F, 2 OF and 6 J, size range: 3.8 ≤ CW ≤ 7.6 mm. Average: CW = 5.5 ± 0.8 mm. UNITAU 201228.

***Micropanope sculptipes* Stimpson, 1871 (Figure 5B)**
Geographic distribution: Western Atlantic – North and South Carolina, Florida, Gulf of Mexico, Antilles and Brazil (from Pará to São Paulo) (Melo 1998).
Material examined: 60 M, 90 F, 29 OF and 12 J, size range: 2.5 ≤ CW ≤ 6.6 mm. Average: CW = 4.8 ± 0.8 mm. UNITAU 201229.

***Xanthodius denticulatus* (White, 1848)**
Geographic distribution: Western Atlantic – Bermuda, Florida, Gulf of Mexico, Antilles, Venezuela and Brazil (Reefs of São Pedro and São Paulo, from Ceará to Bahia, and São Paulo) (Melo 1998; Alves *et al.* 2006).
Material examined: 1 M, 3 F, 1 OF and 1 J, size range: 9.8 ≤ CW ≤ 25.2 mm. Average: CW = 17.8 ± 5.5 mm. MZUSP 16710 (1); UNITAU 201239 (5).

Subfamily Zosiminae Alcock, 1898

***Platypodiella spectabilis* (Herbst, 1794)**
Geographic distribution: Western Atlantic – Bermuda, Florida, Gulf of Mexico, Antilles, Venezuela and Brazil (Fernando de Noronha, Trindade Island, and from Rio Grande do Norte to São Paulo) (Melo 1998).
Material examined: 11 M, 7 F, 3 OF and 2 J, size range: 6.3 ≤ CW ≤ 21.1 mm. Average: CW = 14.0 ± 3.7 mm. All individuals were found associated with *Palythoa caribaeorum* (Duchassaing and Michelotti, 1860). UNITAU201231.

Superfamily Pinnotheroidea De Haan, 1833

Family Pinnotheridae De Haan, 1833

Subfamily Pinnotherinae De Haan, 1833

***Fabia byssomiae* (Say, 1818) (Figure 5C)**
Geographic distribution: Western Atlantic – Brazil (from Rio de Janeiro to Rio Grande do Sul) and Argentina (Melo 1998).
Material examined: 2 F, size range: 5.7 ≤ CW ≤ 6.0 mm. Average: CW = 5.8 ± 0.2 mm. Identified by Melo (1996) as *Fabia emiliai* Melo, 1971; however, according to Ng *et al.* (2008), this species must be viewed as a junior synonym of *F. byssomiae*. All individuals were found in the mantle of bivalves of the family Limidae Rafinesque, 1815. UNITAU 201232.

***Tumidotheres maculatus* (Say, 1818) (Figure 5D)**
Geographic distribution: Western Atlantic – From Massachusetts to Florida, Gulf of Mexico, Antilles, Venezuela and Brazil (from Maranhão to São Paulo), Uruguay and Argentina (Melo 1998; Hernández *et al.* 1999; Coelho *et al.* 2008).
Material examined: 1 F, CW = 4.0 mm. UNITAU 201233.

The crab richness recorded for this region is the highest reported for this kind of habitat on the Brazilian coast, and comprises almost 20% of the total of species recorded from the entire Argentinean Biogeographical Province (see Boschi 2000a). Some studies have demonstrated the significant diversity of brachyuran crabs associated with unconsolidated bottoms on the southeastern Brazilian coast (Bertini and Fransozo 2004; Bertini *et al.* 2004; Braga *et al.* 2005; Bertini *et al.* 2010). Despite these available data, the ecology of brachyuran crabs of this region remains little explored, reinforcing the urgency of increasing the research effort to monitor this fauna on the Brazilian coast.

Areas of high species richness or areas that host endemic or threatened species are recognized as hotspots of diversity, and must be a priority for conservation policies (Myers *et al.* 2000; Margules *et al.* 2002; Fox and Beckley 2005; Tchouto *et al.* 2006). The large level of richness of

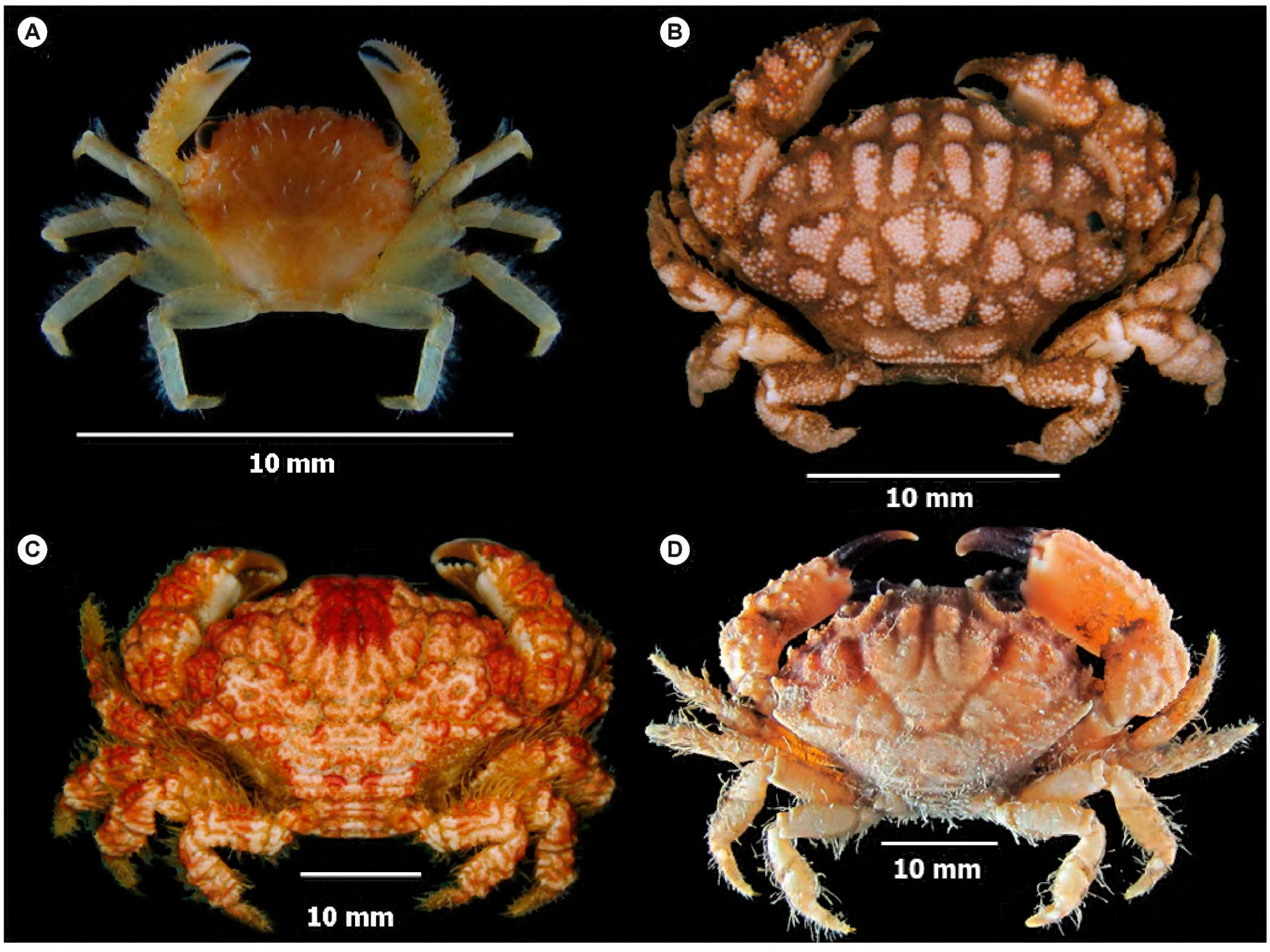

Figure 4. Brachyuran crabs from Vitória Archipelago, Brazil: A) *Domecia acanthophora* (Desbonne, in Desbonne and Schramm, 1867); B) *Paractaea nodosa* (Stimpson, 1860); C) *Glyptoxanthus vermiculatus* (Lamarck, 1818); D) *Cataleptodius parvulus* (Fabricius, 1793) (Photos: D.F.R. Alves).

crabs found in the Vitória Archipelago indicates its great degree of conservation, suggesting that the area must be recognized as an important region to be taken as a model for conservation management studies and policies along the southeastern Brazilian coast.

The Vitória Archipelago is located near the port of São Sebastião, one of the most important Latin American ports, which moves about 400,000 tons/year (SET 2007), especially oil. Despite its potential for economic development, this region is seriously threatened by the constant risk of oil spills. For example, in 1978 the cargo ship Brazilian Marina spilled about 6000 tons of oil on the Brazilian southeastern coast, and other, smaller spills are frequent (SET 2007).

In addition, the port areas are "entrance doors" for non-indigenous species, which could be introduced by ballast water or encrusted on the hulls of ships, as reported by Mansur *et al*. (2003), Alves *et al*. (2006) and Thayer and Stahlnecker (2006). Introduction of exotic species, especially in already impacted environments, could significantly change community relationships and even result in local extinctions of indigenous species (Levin *et al*. 2002; Tavares and Mendonça Jr. 2004; Weigle *et al*. 2005).

Recent reports extending the known geographical distributions for one porcellanid and nine brachyuran crabs (see Alves *et al*. 2006; Camargo *et al*. 2010) reinforcing the necessity to increase research efforts concerning the biodiversity on subtidal rocky bottoms of the Brazilian coast. In addition, for many of these newly recorded species, a large discontinuity of occurrence along this coast was observed (*e.g*. *Teleophrys ornatus, Domecia acanthophora, Cataleptodius parvulus, Xanthodius denticulatus*). These gaps may result from insufficient collecting efforts in this kind of environment, or may indicate introductions by unnatural means of transport such as ship ballast water.

The Vitória Archipelago offers shelter and food for a wide diversity of marine animals, with a potential for recognition as a marine biological reserve. This concept must be seriously considered by the local governments, because this region seems to be a key site, or even a hotspot for the conservation of marine biodiversity of the southeastern Brazilian coast.

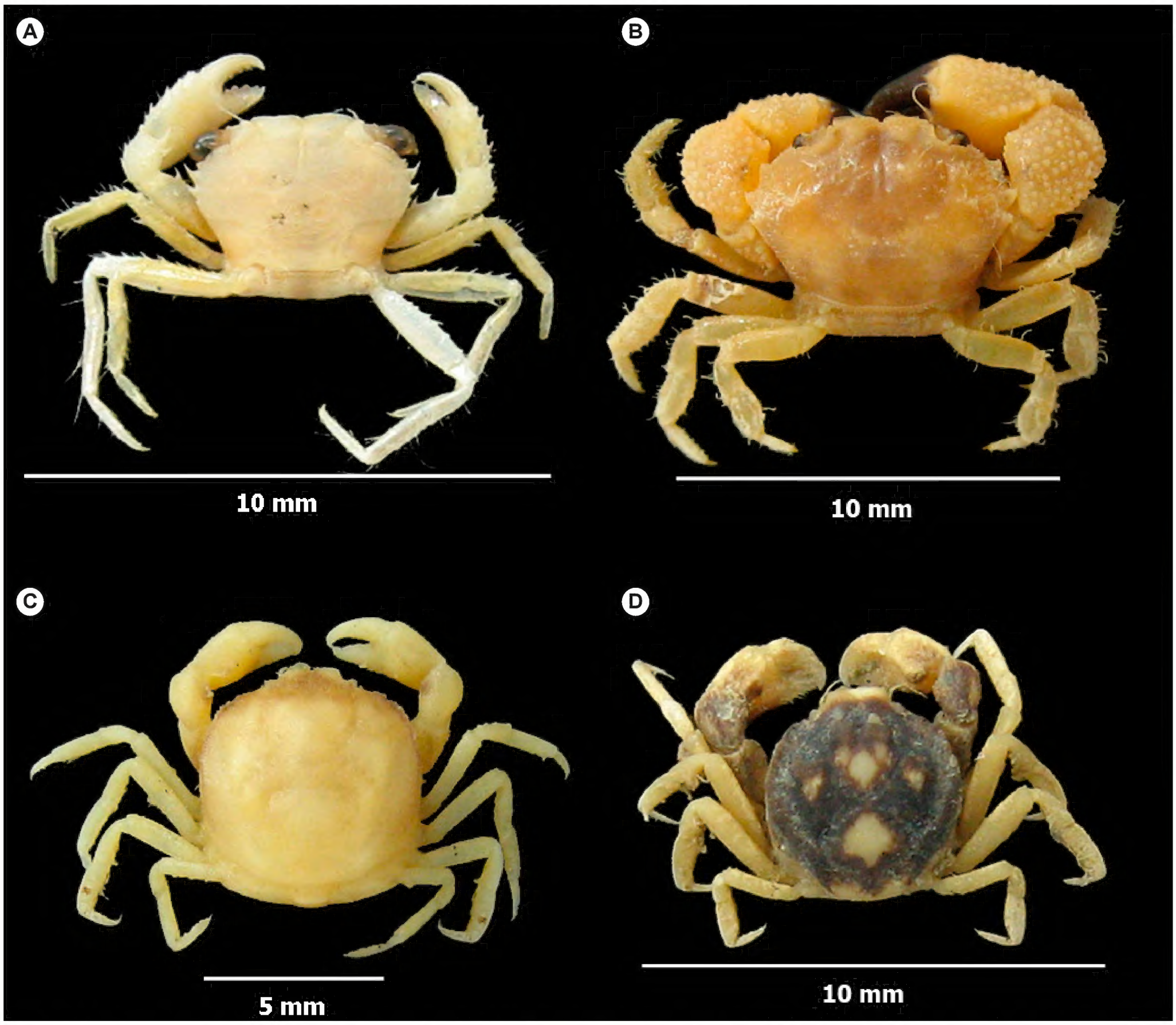

Figure 5. Brachyuran crabs from Vitória Archipelago, Brazil: A) *Melybia thalamita* Stimpson, 1871; B) *Micropanope sculptipes* Stimpson, 1871; C) *Fabia byssomiae* (Say, 1818); D) *Tumidotheres maculatus* (Say, 1818) (Photos: D.F.R. Alves).

Table 1. List and number of species of the brachyuran crabs obtained in Vitoria Archipelago, São Paulo, Brazil. CI= Cabras Island; PI= Pescadores Island; VI= Vitoria Island.

SUPERFAMILY	FAMILY	SUBFAMILY	SPECIES	CI	PI	VI	N
Dromioidea	Dromiidae	Dromiinae	*Dromia erythropus*	0	1	0	1
			Moreiradromia antillensis	0	0	1	1
Eriphioidea	Menippidae		*Menippe nodifrons*	13	4	18	35
Leucosioidea	Leucosiidae	Ebaliinae	*Ebalia stimpsoni*	0	1	0	1
Majoidea	Epialtidae	Pisinae	*Apiomithrax violaceus*	0	0	3	3
		Tychinae	*Pitho lherminieri*	1	1	4	6
	Inachidae		*Stenorhynchus seticornis*	105	87	215	407
	Majidae	Mithracinae	*Microphrys antillensis*	1	0	15	16
			Mithraculus coryphe	6	0	1	7
			Mithraculus forceps	319	127	1082	1528
			Mithraculus sculptus	1	0	3	4
			Mithrax braziliensis	1	2	8	11
			Mithrax hispidus	2	0	0	4
			Mithrax tortugae	33	9	75	117
			Mithrax verrucosus	0	0	16	16
			Nemausa acuticornis	2	1	1	4
			Teleophrys ornatus	1	1	0	2
Pilumnoidea	Piluminidae	Pilumninae	*Pilumnus reticulatus*	5	0	6	11
			Pilumnus spinosissimus	4	2	13	19
Portunoidea	Portunidae	Portuninae	*Achelous tumidulus*	1	1	0	2
			Cronius ruber	8	2	5	15
Trapezioidea	Domeciidae	Domoeciinae	*Domecia acanthophora*	0	0	12	12
Xanthoidea	Panopeidae	Panopeinae	*Acantholobulus schmitti*	5	5	23	33
			Hexapanopeus angustifrons	20	6	45	71
			Hexapanopeus caribbaeus	19	10	118	147
			Hexapanopeus paulensis	5	6	27	38
			Panopeus austrobesus	1	1	6	8
			Panopeus harttii	26	9	73	108
			Panopeus occidentalis	4	1	14	19
			Panopeus rugosus	2	2	26	30
	Xanthidae	Actaeinae	*Paractaea nodosa*	3	0	9	12
		Euxanthinae	*Glyptoxanthus vermiculatus*	5	0	9	9
		Xanthinae	*Cataleptodius floridanus*	0	0	6	6
			Cataleptodius parvulus	2	1	2	5
			Garthiope spinipes	0	0	1	1
			Melybia thalamita	0	0	5	5
			Micropanope nuttingi	21	14	111	146
			Micropanope sculptipes	36	9	146	191
			Xanthodius denticulatus	0	1	5	6
		Zosiminae	*Platypodiella spectabilis*	0	0	23	23
Pinnotheroidea	Pinnotheridae	Pinnotherinae	*Fabia byssomiae*	0	0	2	2
			Tumidotheres maculatus	0	0	1	1

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